SUMMARY OF THE ANALYSIS OF FISH COLLECTED DURING 2002 FOR THE REGIONAL AMBIENT FISH TISSUE MONITORING PROGRAM IN IOWA

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May 2003

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Introduction:

To supplement other environmental monitoring programs and to protect the health of people consuming fish from waters within this state, the state of Iowa conducts fish tissue monitoring. Since 1980, the Iowa Department of Natural Resources (IDNR), the United States Environmental Protection Agency Region VII (U.S. EPA), and the University of Iowa Hygienic Laboratory (UHL) have cooperatively conducted annual statewide collections and analyses of fish for toxic contaminants. Beginning in 1983, this monitoring effort became the Regional Ambient Fish Tissue Monitoring Program (the RAFT program). Currently, the RAFT program is the only statewide fish contaminant-monitoring program in Iowa. Historically, the data generated from the RAFT program have enabled IDNR to document temporal changes in contaminant levels and to identify Iowa lakes and rivers where high levels of contaminants in fish potentially threaten the health of fish consuming Iowans. The Iowa RAFT monitoring program incorporates three different but equally important types of monitoring sites: 1) status, 2) trend, and 3) follow-up.

Status monitoring:

The majority of RAFT sites sampled each year determines whether the waterbodies meet the "fish consumption" portion of the fishable goal of the federal Clean Water Act. In other words, these sites are used to screen for contamination problems and to determine the water quality "status" of the waterbodies. Analyses for a variety of pesticides, other toxic organic compounds, and metals are conducted on samples of omnivorous bottom-dwelling fish and carnivorous predator fish. Most status sites on rivers and lakes have either never been sampled or have not been sampled within the last five years (rivers) or 10 years (lakes). Staff of the IDNR divisions of Environmental Services and Fish & Wildlife selects status sites. Status monitoring occurs on most types of Iowa waterbodies (interior rivers, border rivers, and manmade and natural lakes) in both rural and urban areas. Lakes and river reaches known to support considerable recreational fishing receive highest priority, but IDNR attempts to sample all lakes and river reaches designated in the *Iowa Water Quality Standards* for recreational fishing. Approximately one-third to one-half of Iowa RAFT status sites is on lakes; the remaining sites are either on interior rivers or on the border rivers (Mississippi, Missouri or Big Sioux).

Trend monitoring:

In 1994, U.S. EPA Region VII, in cooperation with the Region VII states (Iowa, Kansas, Missouri, and Nebraska), identified stations that would be monitored every other year to determine trends in levels of contamination. One sample of three to five common carp from each station is submitted for whole-fish analysis. Whole-fish samples are more likely to contain detectable levels of most contaminants than are fillet samples (edible portions). Examination of the trend monitoring results may expose temporal changes in contaminant concentrations and the possibility of new contaminants entering the food chain. In Iowa, the following ten locations are part of the RAFT trend monitoring.

Stations first sampled in 1994 and sampled in even years since:

1. Mississippi River downstream from Dubuque, Dubuque County

2. Mississippi River downstream from Linwood, Scott County
3. Wapsipinicon River north of Donahue, Scott County
4. Des Moines River at Keosauqua, Van Buren County
5. Little Sioux River near Washta, Ida County

Stations first sampled in 1995 and sampled in odd years since:

6. Mississippi River at Lansing, Allamakee County
7. Maquoketa River at Maquoketa, Jackson County
8. Iowa River at Wapello, Louisa County
9. Skunk River at Augusta, Lee County
10. Des Moines River at Des Moines, Polk County

Follow-up Monitoring:

If levels of contaminants in status samples exceed federal guidelines and/or IDNR levels of concern (Table 1), the RAFT program conducts follow-up monitoring to better define the levels of contaminants. For example, if status monitoring shows that contaminant levels in fish from a waterbody exceed IDNR levels of concern, additional samples will be collected as part of follow-up monitoring for the next year's RAFT program. If follow-up monitoring shows that levels of contamination exceed federal guidelines for protection of human health, IDNR may conduct intensive follow-up monitoring. This will allow the confirmation that contaminant levels exceed guidelines and the issuance of a fish consumption advisory is justified.

2002 Results:

The 2002 RAFT program in Iowa involved the collection of 35 samples from 20 waterbodies for three types of RAFT sites (Table 2). In July, August, and September, IDNR fisheries biologists collected, processed, and prepared the 2002 RAFT samples for shipping. These activities were conducted according to procedures described in the workplan for the 2002 RAFT in Iowa (IDNR 2002). Once frozen, samples were transported or shipped to the Des Moines office of the UHL. Samples were stored at the UHL until shipment to the U.S. EPA Region VII laboratory in Kansas City, Kansas. All samples were shipped to the U.S. EPA Region VII laboratory for analysis by December 2002. Samples were analyzed for a variety of contaminants, including pesticides, other toxic organic compounds, and toxic metals (Table 1). IDNR received results of sample analyses in May 2003.

Status monitoring in 2002 included collection of 26 composite fillet samples from 14 sites. Trend monitoring included collection of five composite whole-fish samples of common carp from five sites. Follow-up monitoring included collection of a composite channel catfish fillet and a composite common carp fillet sample from two sites. The criteria used to evaluate the results of this monitoring (i.e., U.S. Food and Drug Administration (FDA) action levels (ALs) and IDNR "levels of concern") are summarized in Table 1. Levels of nearly all contaminants were low in all samples collected. The channel catfish fillets from Cedar Lake, Cedar Rapids and Ottumwa Lagoon, Ottumwa contained amounts of technical chlordane (0.78 and 0.77 ppm, respectively) that exceeded the FDA AL of 0.3 ppm. The common carp fillets from the aforementioned sites had technical chlordane levels (0.20 and 0.24 ppm, respectively) that exceeded the IDNR technical chlordane level of concern of 0.15 ppm but were less than the FDA technical chlordane AL of 0.3 ppm. The level of total PCBs (sum of Aroclors 1248, 1254 and 1260) found in the Cedar Lake catfish fillets (1.22 ppm) exceeded the IDNR total PCBs level of concern of 1.0 ppm but was less than the FDA total PCBs AL of 2.0 ppm. The whole fish common carp sample from the Wapsipinicon trend site had a technical chlordane level (0.19 ppm) that was higher than the IDNR level of concern of 0.15 ppm but less than the FDA technical chlordane AL of 0.3 ppm. Results for total mercury, total PCBs, and technical chlordane are summarized in Table 2 and in Figures 1 and 2.

Site-specific information:

The following summarizes RAFT monitoring in 2002 at each of the 20 sampled sites. The following 2002 RAFT site summaries; listed alphabetically according to the IDNR fisheries biologist that collected the samples; also

include the county of the sample and type of RAFT site. In addition, Table 2 and Figures 1 and 2 contain the 2002 RAFT sites and select results.

Mississippi River, below mouth Catfish Creek - Dubuque, Dubuque Co. (trend site, Boland): The composite sample of whole-fish common carp collected from this site as part of RAFT trend monitoring in 2002 had very low levels of contaminants. This sample did not contain levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the sample were as follows: mercury: 0.066 ppm; total PCBs: 0.199 ppm; and technical chlordane: 0.063 ppm.

Lake Pahoja, near Larchwood, Lyon Co. (status site, Christianson): Composite samples of fillets from channel catfish collected in 2002 had very low levels of contaminants (a predator species was not available at this site). Levels of contaminants in this sample did not approach even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.036 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.030 ppm.

Ottumwa Lagoon, Ottumwa, Wapello Co. (follow-up site, Flammang): Due to historically high levels of chlordane in bottom-feeding fish from this site, a composite sample of common carp and channel catfish fillets were collected in August 2002 as part of RAFT follow-up monitoring. Results show that levels of technical chlordane in this sample are high relative to other RAFT sample sites in Iowa. Levels of primary contaminants in the composite common carp fillets were as follows: mercury: 0.095 ppm; total PCBs: 0.106 ppm; and technical chlordane: 0.240 ppm. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.021 ppm; total PCBs: 0.143 ppm; and technical chlordane: 0.780 ppm. Based on this information, the fish consumption advisory issued for this lake in 2001 will continue.

Des Moines River, Keosauqua, Van Buren Co. (trend site, Flammang): The composite sample of whole-fish common carp collected from this site as part of RAFT trend monitoring in 2002 had low levels of contaminants. This sample did not contain levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the sample were as follows: mercury: 0.101 ppm; total PCBs: 0.135 ppm; and technical chlordane: 0.120 ppm.

Mississippi River, Mud Lake near Dubuque, Dubuque Co. (status site, Gritters): Composite samples of fillets from common carp and largemouth bass collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of common carp fillets were as follows: mercury: 0.072 ppm; total PCBs: 0.207 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of largemouth bass fillets were as follows: mercury: 0.125 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

Maquoketa River, Bailey's Ford Access, Delaware Co. (status site, Hayes): Composite samples of fillets from channel catfish and largemouth bass collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.056 ppm; total PCBs: 0.090 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of largemouth bass fillets were as follows: mercury: 0.196 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

West Fork Cedar River, Near Allison, Butler Co. (status site, Hayes): Composite samples of fillets from channel catfish and smallmouth bass collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.105 ppm; total PCBs: 0.094 ppm; and technical chlordane: 0.045 ppm. Levels of primary

contaminants in the composite sample of smallmouth bass fillets were as follows: mercury: 0.080 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

Nishnabotna River, Hamburg, Fremont Co. (status site, Hudson): Composite samples of fillets from common carp collected in 2002 had very low levels of contaminants (a predator species was not available at this site). Levels of contaminants in this sample did not approach even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of common carp fillets were as follows: mercury: 0.085 ppm; total PCBs: <0.093 ppm; and technical chlordane: 0.030 ppm.

Upper Iowa River, near Decorah, Winneshiek Co. (status site, Kalishek): Composite samples of fillets from common carp and smallmouth bass collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of common carp fillets were as follows: mercury: 0.036 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of smallmouth bass fillets were as follows: mercury: 0.334 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. However, the level of mercury in the smallmouth bass fillets at this site does exceed the EPA recommended level of 0.3 ppm.

French Creek, NW of Churchtown, Allamakee Co. (status site, Kalishek): Composite samples of fillets from white sucker and brown trout collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of white sucker fillets were as follows: mercury: 0.022 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of brown trout fillets were as follows: mercury: 0.028 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

Wapsipinicon River, north of Donahue, Scott Co. (status site, Kline): Composite samples of fillets from channel catfish and flathead catfish collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.087 ppm; total PCBs: <0.09 ppm; and technical chlordane: 0.069 ppm. Levels of primary contaminants in the composite sample of flathead catfish fillets were as follows: mercury: 0.036 ppm; total PCBs: <0.091 ppm; and technical chlordane: <0.03 ppm.

Wapsipinicon River, north of Donahue, Scott Co. (trend site, Kline): The composite sample of whole-fish common carp collected from this site as part of RAFT trend monitoring in 2002 had low levels of contaminants. This sample did contain a technical chlordane level that exceeded one-half the respective FDA AL or IDNR level of concern of 0.15 ppm. Levels of primary contaminants in the sample were as follows: mercury: 0.095 ppm; total PCBs: 0.125 ppm; and technical chlordane: 0.190 ppm.

Middle River, SW of Winterset, Madison Co. (status site, McGhee): Composite samples of fillets from channel catfish and walleye collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.142 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of walleye fillets were as follows: mercury: 0.184 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

North Twin Lake, Calhoun Co. (status site, Miller): Composite samples of fillets from channel catfish and white crappie collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of

primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: <0.0181 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of white crappie fillets were as follows: mercury: <0.0181 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

Little Sioux River, near Washta, Ida Co. (trend site, Miller): The composite sample of whole-fish common carp collected from this site as part of RAFT trend monitoring in 2002 had very low levels of contaminants. This sample did not contain levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the sample were as follows: mercury: 0.077 ppm; total PCBs: 0.105 ppm; and technical chlordane: 0.049 ppm.

Mississippi River, at Buffalo, Scott Co. (trend site, Schonhoff): The composite sample of whole-fish common carp collected from this site as part of RAFT trend monitoring in 2002 had very low levels of contaminants. This sample did not contain levels of contaminants that approached even one-half the respective ALs or IDNR levels of concern. Levels of primary contaminants in the sample were as follows: mercury: 0.133 ppm; total PCBs: 0.295 ppm; and technical chlordane: 0.069 ppm.

Mississippi River, near Muscatine, Muscatine Co. (status site, Schonhoff): Composite samples of fillets from channel catfish and flathead catfish collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.055 ppm; total PCBs: 0.123 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of flathead catfish fillets were as follows: mercury: 0.044 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

Cedar River, Pallisades Park – Cedar Rapids, Linn (status site, Sleeper): Composite samples of fillets from channel catfish and freshwater drum collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.259 ppm; total PCBs: 0.143 ppm; and technical chlordane: 0.034 ppm. Levels of primary contaminants in the composite sample of freshwater drum fillets were as follows: mercury: 0.085 ppm; total PCBs: 0.164 ppm; and technical chlordane: 0.032 ppm.

Cedar Lake, Cedar Rapids, Linn Co. (follow-up site, Sleeper): Due to historically high levels of technical chlordane in bottom-feeding fish from this site, two composite samples of common carp and channel catfish fillets were collected in July 2002 as part of RAFT follow-up monitoring. Results show that levels of technical chlordane in this sample are high relative to other RAFT sample sites in Iowa. Levels of primary contaminants in the composite sample of common carp fillets were as follows: mercury: 0.028 ppm; total PCBs: 0.440 ppm; and technical chlordane: 0.20 ppm. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: <0.0181 ppm; total PCBs: 1.22 ppm; and technical chlordane: 0.77 ppm. Based on this information, the fish consumption advisory issued for this lake in 1986 will continue.

Clear Lake, at Clear Lake, Cerro Gordo Co. (status site, Wahl): Composite samples of fillets from channel catfish and walleye collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: <0.0181 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of smallmouth bass fillets were as follows: mercury: 0.045 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

East Fork Des Moines River, near Algona, Kossuth Co. (status site, Wahl): Composite samples of fillets from channel catfish and walleye collected in 2002 had very low levels of contaminants. Neither sample contained levels of contaminants that approached even one-half the respective FDA ALs or IDNR levels of concern. Levels of primary contaminants in the composite sample of channel catfish fillets were as follows: mercury: 0.069 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm. Levels of primary contaminants in the composite sample of walleye fillets were as follows: mercury: 0.154 ppm; total PCBs: <0.09 ppm; and technical chlordane: <0.03 ppm.

References:

IDNR. 2002. Sampling procedures for the 2002 Region VII Ambient Fish Tissue Monitoring Program in Iowa. Water Quality Bureau, Environmental Protection Division, Iowa Department of Natural Resources. 19 pp.

Table 1. Summary of contaminants and respective criteria for samples of fish collected for the 2002 Regional Ambient Fish Tissue (RAFT) monitoring program in Iowa.

	Contaminant	Detection Level wet weight ppm	FDA Action Level wet weight ppm	IDNR "level of concern" wet weight ppm
1	BHC (lindane)	0.002	none	0.1
2	cadmium	0.06	none	0.3
3	chlordane, technical	0.03	0.3	0.15
4	chlordane, cis-	0.002	sum = 0.3	sum = 0.15
5	chlordane, trans-	0.002		
6	nonachlor, cis-	0.002		
7	nonachlor, trans-	0.002		
8	oxychlordane	0.002		
9	DDD, 4,4'-	0.004	sum = 5.0	sum = 2.5
10	DDE, 4,4'-	0.005		
11	DDT, 4,4'-	0.005		
12	diazinon*	0.04	none	none
13	dieldrin	0.003	0.3	0.15
14	heptachlor	0.003	sum = 0.3	sum = 0.15
15	heptachlor epoxide	0.003		
16	hexachlorobenzene	0.001	none	0.01
17	lead	0.17	none	1.0
18	mercury	0.0181	1.0	0.5
19	mirex*	0.003	0.1	0.05
20	PCB-Aroclor 1248	0.04	sum = 2.0	sum = 1.0
21	PCB-Aroclor 1254	0.03		
22	PCB-Aroclor 1260	0.002		
23	pentacloroanisole	0.001	none	0.1
24	pentachlorobenzene*	0.001	none	
25	selenium	0.5	none	
26	1,2,4,5-tetrachlorobenzene*	0.004	none	
27	trifluralin	0.003	none	0.2

*trend samples only

Table 2. Summary of samples, sample sites, species sampled, and results for mercury, total PCBs (sum of Aroclors 1248, 1254 and 1260), and technical chlordane collected for the 2002 RAFT program in Iowa.

Waterbody/Site Location	County	RAFT Sample Type	Fish Species/Part Used	Total Mercury (ppm)	Total PCBs (ppm)	Technical chlordane (ppm)
Cedar Lake (Cedar Rapids)	Linn	follow-up	channel catfish fillets	<0.018	1.220	0.770
Cedar Lake (Cedar Rapids)	Linn	follow-up	common carp fillets	0.028	0.440	0.200
Cedar River (at Pallisades Park Downstream from Cedar Rapids)	Linn	status	channel catfish fillets	0.259	0.143	0.034
Cedar River (at Pallisades Park Downstream from Cedar Rapids)	Linn	status	freshwater drum fillets	0.085	0.164	0.032
Clear Lake (Clear Lake)	Cerro Gordo	status	channel catfish fillets	<0.018	<0.090	<0.030
Clear Lake (Clear Lake)	Cerro Gordo	status	walleye fillets	0.045	<0.090	<0.030
Des Moines River (at Keosauqua)	Van Buren	trend	whole common carp	0.101	0.135	0.120
East Fork Des Moines River (near Algona)	Kossuth	status	channel catfish fillets	0.069	<0.090	<0.030
East Fork Des Moines River (near Algona)	Kossuth	status	walleye fillets	0.154	<0.090	<0.030
French Creek (NW of Churchtown)	Allamakee	status	white sucker fillets	0.022	<0.090	<0.030
French Creek (NW of Churchtown)	Allamakee	status	brown trout fillets	0.028	<0.090	<0.030
Lake Pahoja (near Larchwood)	Lyon	status	channel catfish fillets	0.036	<0.090	<0.030
Little Sioux River (near Washta)	Ida	trend	whole common carp	0.077	0.105	0.049
Maquoketa River (Baileys Ford Access - Above/Below Bailey's Ford Park)	Delaware	status	channel catfish fillets	0.056	0.090	<0.030
Maquoketa River (Baileys Ford Access - Above/Below Bailey's Ford Park)	Delaware	status	largemouth bass fillets	0.196	<0.090	<0.030
Middle River (SW of Winterset)	Madison	status	channel catfish fillets	0.142	<0.090	<0.030
Middle River (SW of Winterset)	Madison	status	walleye fillets	0.184	<0.090	<0.030
Mississippi River (at Buffalo)	Scott	trend	whole common carp	0.133	0.295	0.069
Mississippi River (Below Mouth of Catfish Creek near Dubuque)	Dubuque	trend	whole common carp	0.066	0.199	0.063
Mississippi River (Mud Lake near Dubuque)	Dubuque	status	common carp fillets	0.072	0.207	<0.030
Mississippi River (Mud Lake near Dubuque)	Dubuque	status	largemouth bass fillets	0.125	<0.090	<0.030
Mississippi River (near Muscatine)	Muscatine	status	channel catfish fillets	0.055	0.123	<0.030
Mississippi River (near Muscatine)	Muscatine	status	flathead catfish fillets	0.044	<0.090	<0.030
Nishnabotna River (at Hamburg)	Fremont	status	common carp fillets	0.085	<0.093	0.030
North Twin Lake	Calhoun	status	channel catfish fillets	<0.018	<0.090	<0.030
North Twin Lake	Calhoun	status	white crappie fillets	<0.018	<0.090	<0.030
Ottumwa Lagoon (Ottumwa)	Wapello	follow-up	channel catfish fillets	0.021	0.143	0.780
Ottumwa Lagoon (Ottumwa)	Wapello	follow-up	common carp fillets	0.095	0.106	0.240
Upper Iowa River (Near Decorah)	Winneshiek	status	common carp fillets	0.036	<0.090	<0.030
Upper Iowa River (Near Decorah)	Winneshiek	status	smallmouth bass fillets	0.334	<0.090	<0.030
Wapsipinicon River (5 miles north of Donahue)	Scott	trend	whole common carp	0.095	0.125	0.190
Wapsipinicon River (5 miles north of Donahue)	Scott	status	channel catfish fillets	0.087	<0.090	0.069
Wapsipinicon River (5 miles north of Donahue)	Scott	status	flathead catfish fillets	0.036	<0.091	<0.030
West Fork Cedar River (Allison - Considine Park to Big Marsh River Access)	Butler	status	channel catfish fillets	0.105	0.094	0.045
West Fork Cedar River (Allison - Considine Park to Big Marsh River Access)	Butler	status	smallmouth bass fillets	0.080	<0.090	<0.030

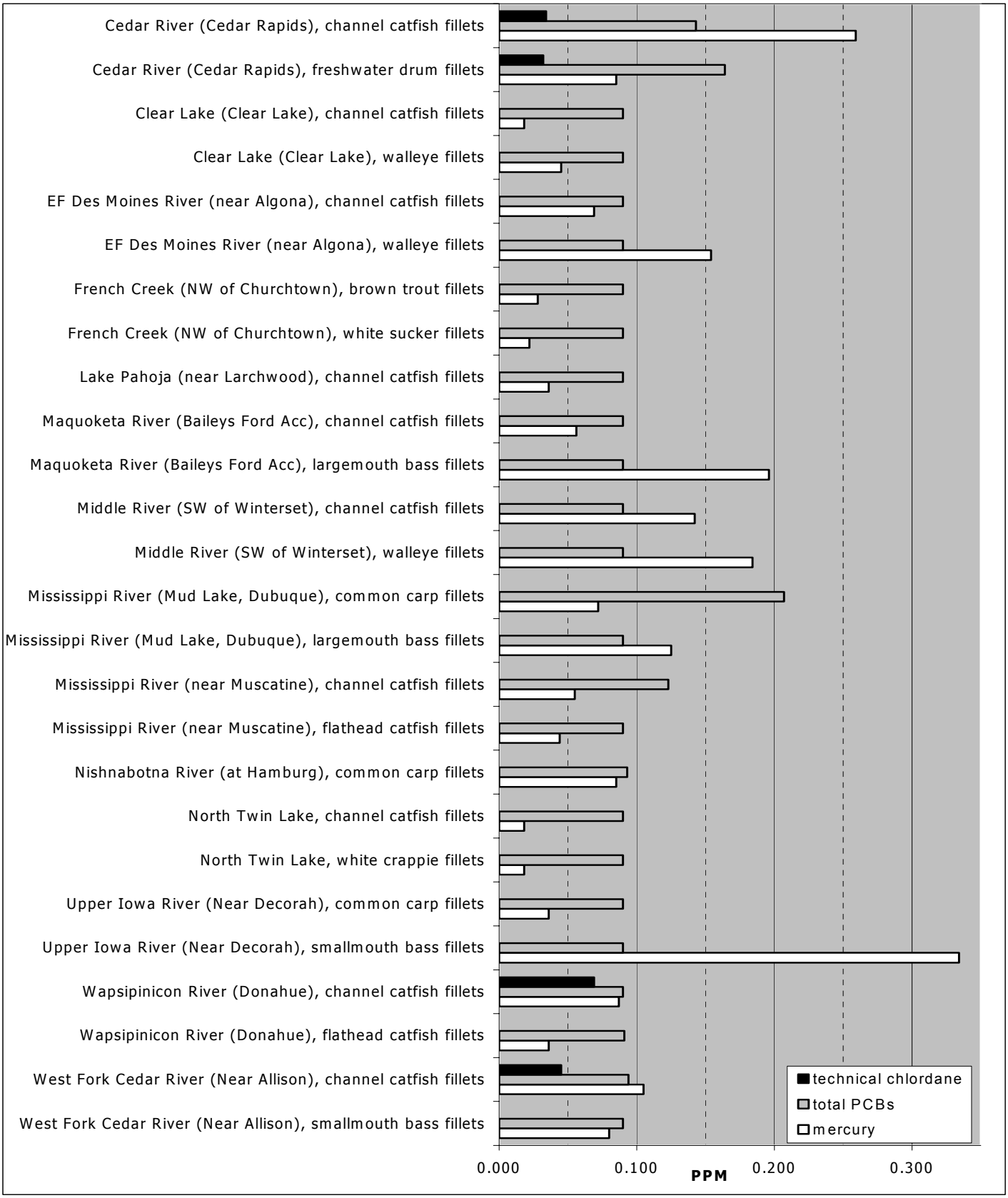

Figure 1. 2002 RAFT status sites and sample results for mercury, total PCBs (sum of Aroclors 1248, 1254 and 1260) and the detected technical chlordane levels. The FDA action level for mercury is 1.0 ppm, for total PCBs is 2.0 ppm, and for technical chlordane is 0.3 ppm.

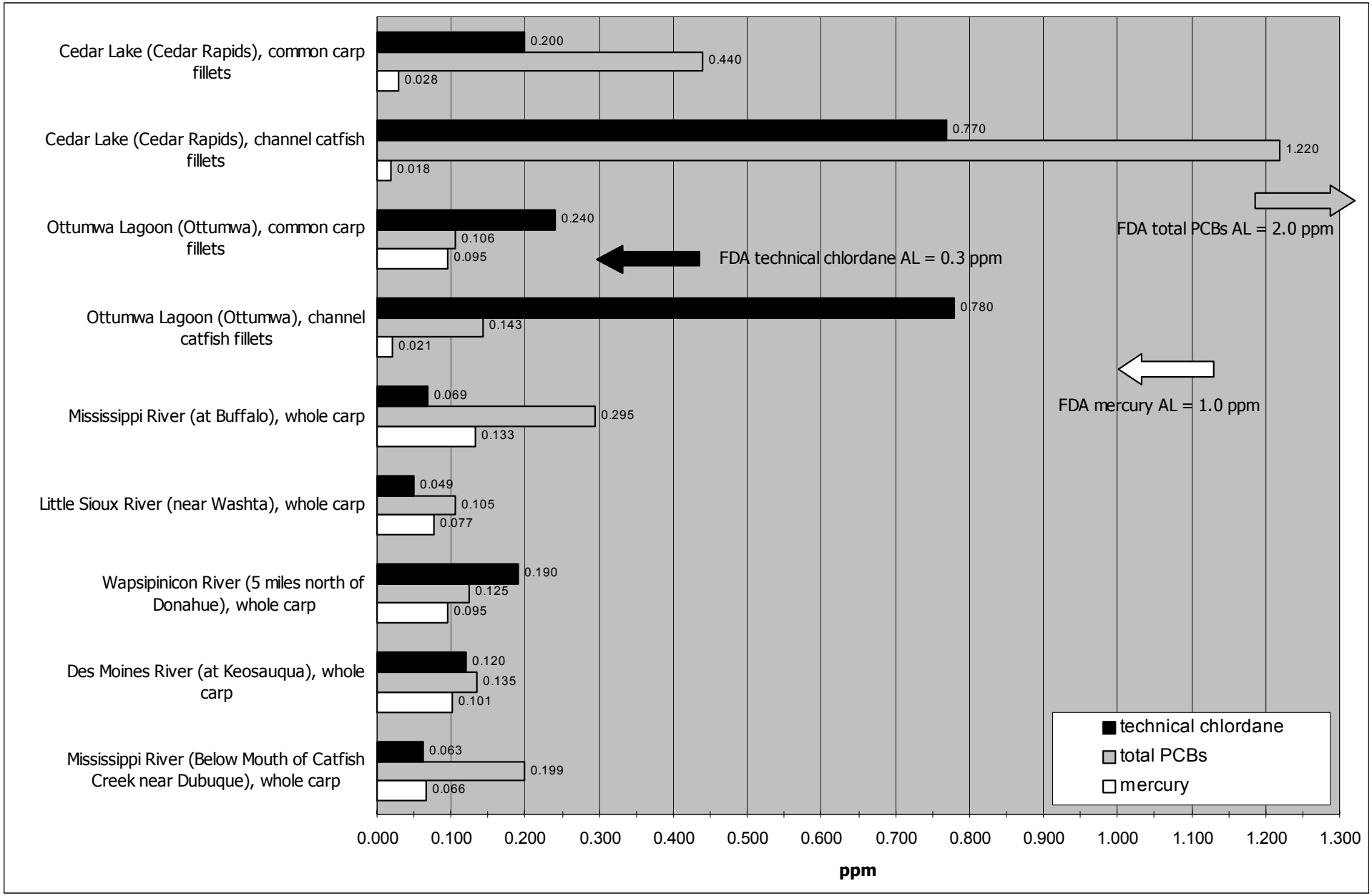

Figure 2. 2002 RAFT trend (whole-fish) and follow-up (fillet) sites and sample results for mercury, total PCBs (sum of Aroclors 1248, 1254 and 1260), and technical chlordane.